Notes

A report on the reproductive morphology of gynander tasar silkmoths *Antheraea mylitta* Drury (Lepidoptera: Saturniidae)

Gynandromorphs are abnormal individuals showing varying degrees of mixed sexual characters. They are known for several insect groups, but are most often encountered in Lepidoptera (Scriber and Evans 1987, Davies 1988, Halstead 1989, Blackaller-Bages and Delgado-Castillo 1990, Forattini *et al.* 1991). Gynandromorphs may occur through the failure of genetic sex determining mechanisms or through hormonal or other influences during development. In the extreme case, one half of such an insect is female, the other half male. Some of the tissues are genetically and structurally female, others male. The genetic basis of gynandromorphism in *Drosophila, Lymantria, Bombyx,* etc. is well documented (Sinnott *et al.* 1958; Altenburg, 1970; Herskowitz, 1977). It has been recently established in mites that gynandromorphism is the result of unequal distribution of sex linked chromosomes rather than control at the gene or physiological level (Homsher and Yunker, 1981).

The occurrence of gynandromorphs is very rare in both wild and commercial populations of the tropical tasar silkmoth, *Antheraea mylitta.* Gynandromorphism in this moth was first reported by Sen and Jolly (1967) wherein they discussed the morphological characters with special reference to the genitalia. This note illustrates the previously unreported morphology of the reproductive system of gynander tasar silkmoths.

Two types of gynandromorph were observed in a commercial laboratory population of the tasar silkmoth: predominately male gynandromorphs and predominately female gynandromorphs. In both cases, the left half of the body was observed to possess the male characters whereas the female characters occurred on the right. The male predominants have well developed testes with a male accessory gland on the left half and on the right half a single atrophied ovary with a mature colleterial gland and a female accessory gland (Fig. 1). In the case of female predominants, the reproductive organ situation was reversed. A single ovary containing four mature ovarioles with a single fully developed colleterial gland and female accessory gland was present. In these individuals the testes remained atrophied and non-functional. The female predominant condition is illustrated in Fig. 2. In both male and female predominant individuals, the genitalia retain important parts of both the female (bursa copulatrix) and male (aedeagus).

It is noteworthy that predominant female gynandromorphs, after mating with normal males, laid very few eggs and these were infertile. By contrast, virgin normal females, when mated with predominant male gynandromorphs laid fertile eggs. A similar reproductive behavior has been reported in gynandromorph *Drosophila melanogaster* by Napolitano and Tompkins (1989). Conventional morphological secondary sex characters such as wing maculation and antenna structure show the typical male features on the left and female features on the right side of the body. The physiological and genetic bases of gynandromorphism in tasar silkmoth remain unknown.

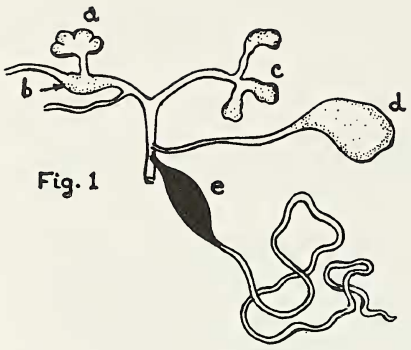

Fig. 1

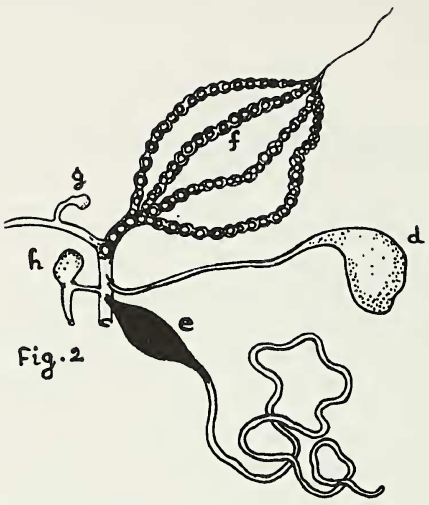

Fig. 2

Figures 1 and 2. Reproductive system of predominant male gynandromorph (Fig. 1) and female gynandromorph (Fig. 2) internal reproductive system of *Antheraea mylitta* Drury. Legends: a) mature testis, b) male accessory gland, c) atrophied ovary, d) female accessory gland, e) colleterial gland, f) mature ovary, g) atrophied testis, h) bursa copulatrix.

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Notes on the Santa Monica Mountains hairstreak *Satyrium auretorum fumosum* Emmel and Mattoni

Since naming this subspecies (Emmel, J. and R. Mattoni. 1990. Jr. Res. Lepid. 28:105-111) several new observations have been made that bear on its conservation biology. Although the life history remains to be formally described, one rearing cycle has been observed in captivity by J. Emmel from eggs laid by a captive female taken 16 June 90 on *Eriogonum fasciculatum* at Carlisle Canyon, Los Angeles Co., CA . The female producing these eggs was confined by Pasko with scrub oak, *Quercus berberidifolia,* but the c. 25 ova recovered were all found embedded in the depressions of the paper toweling lining the bottom of the box. Egg diapause was followed by 15 larvae emerging in late spring with all larvae feeding to pupation and eclosion. The 10 larvae retained by Pasko were reluctant to start feeding on the fresh but mature shoots of *Q. berberidifolia* provided for food. The earlier hypothesis of Emmel and Mattoni asserted that the butterfly was restricted to scrub oaks, mostly *Q. berberidifolia* in the Santa Monica Mountains, a relative of the known scrub oak foodplant of the nominate subspecies. Adults were never observed on or around scrub oak in the Santa Monica Mountains. Until now *fumosum* appeared to have a highly limited distribution and was also very sparse where found. This represents an unusual pattern for an insect taxon unless it were near a terminal stage of extinction.

Initial field observations noted that adults were rarely found nectaring, and when nectaring was observed the source was always common buckwheat, *Eriogonum fasciculatum.* On 29 May 1993 Pasko again observed several flight worn *fumosum* nectaring at the small isolated patch of *E. fasciculatum* in Carlisle Canyon where the 1990 specimens were taken. Nearby were two small scrub oaks and several large trees of coast live oak, *Q. agrifolia.* Upon tapping the branches of both oak species, one male *fumosum* was obtained from *Q. agrifolia.* Further searching led to the discovery of several of both sexes on another *Q.agrifolia* several hundred feet away from the first tree. No additional adults were observed from ten other trees in the vicinity. On 23 April 1994 Pasko confirmed *Q. agrifolia* as the correct foodplant by collecting eight last instar larvae in the field at the Carlisle Canyon site. These larvae were taken by beating the lower terminal branches that bore young and tender new growth leaves.

At this Carlisle Canyon site a group of about 25 mature *Q.agrifolia* trees form an isolated patch as an oak savannah association within which *fumosum* larvae were found on only four trees. Many of these trees, however, are large and cannot be adequately sampled for either larvae or adults. Ants were always present, but specimens were not retained for identification and no specific ant-larvae interactions were seen although the species is known to be strongly attractive to ants (G. Ballmer, pers. comm.). Large numbers of microlepidoptera larvae were also present that could account for the presence of the large number of ants.

Five of the eight larvae were parasitized by an unidentified species of small Diptera. The three survivors located pupation sites within two days and eclosed